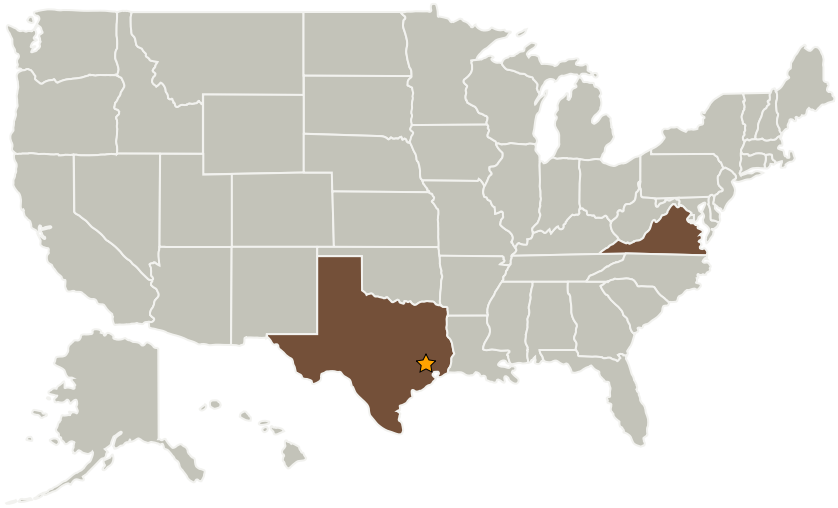
Radiation Target Area Sample Environmental Chamber (RTASEC), Phase I

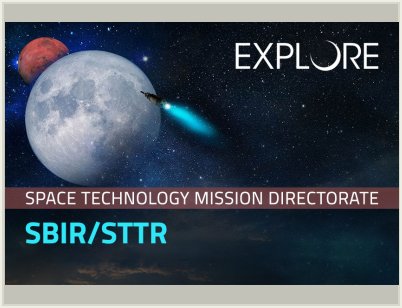
Completed Technology Project (2007 - 2007)

Project Introduction

Payload Systems Inc. proposes the Radiation Target Area Sample Environmental Chamber (RTASEC) as an innovative approach enabling radiobiologists to investigate the real-time, long-term radiation effects on living cells and tissues. Most current research into radiation effects on living cultures is limited to short duration radiation exposure because of the lack of in-situ equipment to provide the environment needed to support cell/tissue culture growth while in the radiation field. While these short-term experiments are vital to understanding cell and tissue culture reaction and adaptation to the radiation environment, long-term exposure at low dose rate is more likely to occur in space, and is more representative of long duration space missions of interest to NASA. We propose developing the RTASEC to enable long-term radiation exposure studies at the Brookhaven National Lab by providing the proper environmental conditions (such as temperature, relative humidity, gaseous oxygen and carbon dioxide concentration, and ambient lighting) needed for the study of a variety of cell/tissue cultures, including mammalian, plant, microbial cells, and tissues, in both suspension and attachment culture modes. The RTASEC can be used with a variety of existing culturing systems, including standard vials, wells, and flasks, such as the T-25, and NASA's rotary bioreactor. As an added benefit, the RTASEC will also be capable of supporting studies involving laboratory animals such as mice and rats.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Aurora Flight Sciences Corporation	Supporting Organization	Industry	Cambridge, Massachusetts

Primary U.S. Work Locations	
Texas	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.5 Radiation
    - TX06.5.1 Radiation Transport and Risk Modeling